HT644 User Guide

v07/11

Professional submersible marine handheld transceivers

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Declaration of Conformity

We Entel UK Limited of:

320 Centennial Avenue
Centennial Park
Elstree
Borehamwood
Hertfordshire
WD6 3TJ
United Kingdom

Declares under our sole responsibility that the product range:

HT644 Series Handheld Radio Transceiver

Conforms to the following standards or other nominative documents:

- EN 301 178-2 V1.2.2: 2007-02, EN 60945:2002, EN60950-1: 2006, in accordance with Directive 1999/5/EC.

Serial Number_____

M Austin

Quality Manager

Date: 1 October 2010

CE

ISO 9001
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Introduction

The Entel HT644 is a professional marine handheld transceiver that operates on the VHF marine band. The HT644 has 58 marine international channels, 10 weather & 36 dealer programmable private channels. The 58 marine channels are switchable to comply with USA, International or Canadian regulations. This is done via the radio's keypad. It has an emergency channel, which can be immediately selected from any channel using the red 16/9 button. Weather channels can also be accessed immediately using the [WX] key. The HT644 includes the following features: Scan, A/B quick access channels, battery life indicator, VOX (voice activated transmit), low battery indicator, large LCD with back light.

Packing List

- HT644 Transceiver
- CNB750E Rechargeable 1800mAh Li-Ion battery
- CBH750 Spring loaded belt clip
- CATXX Antenna
- CCA trickle charger included with certain models

Radio Care

Warranty

The HT644 comes with a 24 month warranty, for details see our full terms & conditions.

Advice

- Do not use options or accessories not specified by Entel
- Ensure that the radio is used within the parameters for which it was designed
- Please switch the transceiver off before connecting optional accessories

Warning

Turn the transceiver off in the following locations:

- In explosive atmospheres (flammable gas, dust including metallic & grain powders etc)
- Whilst taking on fuel or while parked near a fuel station
- Near explosives or blasting sites
- In aircraft, medical institutions or near persons known to be wearing a pacemaker

Caution

- Do not disassemble or modify the transceiver for any reason
- Do not transmit while touching the antenna terminal or any exposed metallic parts of the aerial as this may result in a burn
- Please check and observe regulations in your country with regard to use whilst driving

Cleaning your Radio

After exposure to any potentially corrosive substance including salt water it is recommended to thoroughly wash the transceiver in fresh water. If washing with the battery removed from the radio, ensure that the battery is not immersed in water & that the accessory cap is attached & clean only with a damp cloth.

Note: Do not wash the transceiver if you suspect the waterproofing seal may be damaged. Please return to your supplier for inspection / repair.

End of Life Disposal

When your Entel transceiver reaches the end of its useful life, please ensure that the unit is disposed of in an environmentally friendly way. For country specific information please see www.entel.co.uk/recycling.

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Preparing Your Radio For Use

Attaching / Removing the Aerial

1 To attach, carefully align the aerial with the socket. Screw in the aerial clockwise (taking care not to cross the thread) until it is seated firmly with the accessory cover's rubber ring between the aerial & the the top of the radio.

2 To remove, unscrew the aerial anti-clockwise.

Attaching / Removing Audio Accessories

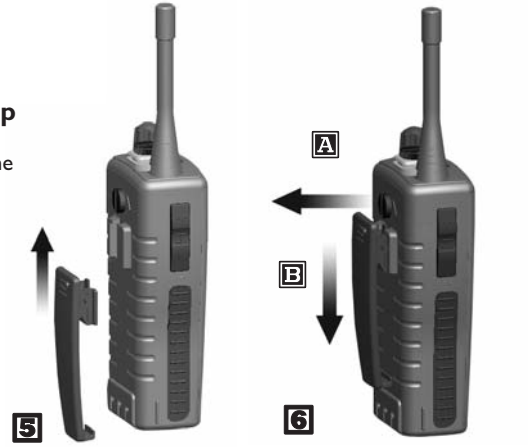
3 To attach, remove the accessory cover by unscrewing the locking screw anti-clockwise (leave cover secured under antenna as this provides a waterproof seal). Attach accessory plug by locating over the socket. Carefully tighten the locking screw clockwise until finger tight (do not tighten with a screwdriver etc).

4 To remove, unscrew accessory plug the locking screw by hand in an anti-clockwise direction (carefully use a coin or screwdriver if too tight). Ensure you re-fit the accessory waterproof cover so as to protect the accessory socket.

Attaching / Removing the Belt Clip

5 To attach, slot the clip onto the slot on the back of the battery and slide up until you hear a "click"

6 To remove, pull the tab towards the belt clip (A). Then slide the belt clip downwards (B)



Battery Care / Information

Introduction

Your Entel radio is supplied with a high performance Lithium-Ion (Li-Ion) battery. These batteries:

- Extend talk time
- Reduce the battery's size and weight
- Do not suffer from 'memory effect' that reduces the life of Ni-Cad and NiMH batteries
- Have a low toxicity, therefore reducing the impact on the environment

Battery Pack

- If a battery is not to be used for an extended period of time (e.g. several months) remove the battery pack from the equipment and store in a cool and dry location (around 0°C) part charged. Do not fully discharge the battery before storage
- Each charge cycle reduces the battery's life. Minimise the number of times you charge your battery especially in hotter environments which further shortens a battery's life

Battery Pack Precautions

- Switch the transceiver OFF before charging
- Charge the battery pack before use
- Do not recharge the battery pack if it is already fully charged.
- Charge the battery in accordance with the instructions enclosed with your charger
- Do not charge the transceiver and /or battery pack if they are wet.

The battery pack includes potentially hazardous components. Please:

- Do Not disassemble or reconstruct battery
- Do Not short-circuit the battery
- Do Not incinerate or apply heat to the battery
- Do Not immerse the battery in water unless attached securely to the radio or get it wet by other means
- Use only the specified charger and observe charging requirements
- Do Not pierce the battery with any object or strike it with an instrument
- Do Not use the battery pack if it is damaged in any way
- Do Not reverse-charge or reverse-connect the battery
- Do Not touch a ruptured or leaking battery.

If liquids from the battery get into your eyes, immediately:

- Wash your eyes out with fresh water & avoiding rubbing them.
- Seek medical treatment.

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Battery Care / Information

Battery Charging

1. Connect the AC adapter to the charger pod. The LED status light will illuminate green indicating ready for charge
2. Turn the transceiver off
3. Insert the battery pack into the charger pod, either with or without the transceiver attached. The LED status light changes from green to RED & trickle charge begins
4. A fully discharged battery pack will take approximately 6 hours to charge, depending on the remaining power condition. When charge is complete, the LED status light turns green.

Overcharging:

The battery pack has an over-current protection circuit fitted. When charging a completely discharged battery i.e. first charge, ensure the battery is removed from the radio and then re-attached (if fitted to radio when charging). This will reset the protection circuitry and ensure normal operation. This process will need to be repeated if the battery is allowed to completely discharge in the future. In normal use this is unlikely.

Battery Indicator

For your safety and convenience your transceiver continually monitors the battery pack and gives an indication on the LCD:

- 3 Segments: 12 hours
- 2 Segments: 1 hour
- 1 Segment: 20 mins

Note: Only genuine Entel batteries should be used. Customer satisfaction is assured as you can not be supplied with sub standard, potentially dangerous battery packs from 3rd party manufacturers, ensuring it delivers the expected capacity and endurance.

On HT series batteries a breathable membrane is used. This is clearly marked on the battery label. Piercing the membrane will allow water ingress to the battery, & will invalidate the warranty.

Attaching / Removing the Battery Pack

1 To attach, locate the pegs on the bottom of the battery into the slots on the radio and press the top of the battery against the radio. Secure battery by tightening the screw clockwise by hand. (Do not over tighten)

2 To remove, unscrew the locking screw anticlockwise & pull the battery away from the top of the radio.

Using Your HT644

Turning The Radio On & Off

Turn the ON/OFF control on the top of the radio clockwise until the LCD iluminates & a short beep is emitted. To turn the radio off turn the ON/OFF control anti-clock wise until the LCD deluminates.

Using Your radio

Before using your radio you may need to adjust the volume on the radio to take in to account background noise. Adjust the volume using the rotary control on the top of the radio.

Reception

1. To Turn the radio on rotate the volume control clockwise, to select the desired audio level continue rotating the control clockwise. to increase volume & counter clockwise to decrease. After power-on, the transceiver will always default to the last channel selected.
2. One second after start-up a tone is generated to indicate the transceiver has passed its self-diagnostic test. During standby the LED indicator will pulse amber every 3 seconds, to verify its circuitry is functioning correctly.
3. Use the [UP/DOWN] keys to select a desired channel. A full listing of all available channels can be found on page 17-18.
4. When receiving a signal the LED indicator illuminates green & an "RX" is displayed on the LCD.
5. While the radio is operating, if you hear white noise you may need to adjust the squelch threshold of the radio, for more information see page 8 "Adjusting Squelch Threshold". On some channels a slight adjustment of the squelch threshold is needed as some channels have a higher noise level than others.

Transmitting

1. Perform steps 1 through 3 of RECEPTION.
2. Before transmitting, monitor the channel and make sure it is clear.
3. For communications over short distances, press the [H/L] key and select low power (1 watt). Transmitting on 1 watt prolongs battery life, and should be selected whenever possible.
4. When receiving a signal, wait until the signal stops before transmitting. The transceiver cannot transmit and receive simultaneously.
5. Press the [PTT] (Push-To-Talk) button to begin your transmission. To confirm transmission in progress the LCD indicator illuminates TX and the LED illuminates RED.
6. Hold the transceiver 1 inch from your mouth and speak slowly and clearly into the microphone.
7. When the transmission is finished release the [PTT] button.

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Channels

INT, USA & Canadian Modes

In compliance with worldwide license regulations the following versions of HT644 are available:

Version A: INT, USA & Canadian modes
Version B, C & D: INT mode only

1. In the case of version A only; to change the channel set of the transceiver, hold down the [WX] key. The mode changes from USA to Canadian to International.
2. Refer to the marine channel charts in this booklet for allocated channels in each mode.

NOAA Weather Channels

(Applicable to version A model only)

1. To receive a weather channel, press the [WX] key. The transceiver enters into weather channel mode.
2. There are 10 weather channels. Use the & buttons to select the desired channel.
3. To exit from the weather channels press the [WX] key. The transceiver recalls the previous working channel.

Emergency Channels

To select the emergency channel, press the [16/9] button from any channel. Channel 16 appears on the display. To recall the previous channel used, press the [16/9] button once again.

Channel 9

Channel 9 is used as a hailing channel for initial, non-emergency contact with other vessels. Hold down the [16/9] key for 1 second to select channel 9.
To recall the previous channel used, press the [16/9] button twice.

Monitor Channels

Press the blue monitor button on the top of the radio to defeat the squelch mute and release button to mute radio. A long press (radio will beep) will hold the squelch mute open until pressed again to cancel again to return to squelch mute.

Adjusting Squelch Threshold

Press & hold the blue monitor button on the top of the radio and switch radio on, then after the radio emits a beep release the blue button. This will cause the radio to display a number representing the squelch threshold from 01-16, 01 is the more sensitive & 16 is the less sensitive.

Use the UP & DOWN channel buttons to adjust the level & press MEM to store the new squelch level.

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SIMPLEX / DUPLEX CHANNEL USE

Your transceiver has been factory programmed in accordance with FCC (USA), Industry Canada and International regulations. The mode of operation cannot be altered from simplex to duplex or vice versa. Simplex or duplex mode is automatically activated, depending on the channel and the channel set and whether USA, Canadian, or International mode is selected.
Refer to the channel charts listed on pages 18-20 of this user manual.
If you have a licence to use a specific simplex or semi-duplex channel, contact your dealer who may be able to programme your channel using the transceiver's private channel memory.

CHANNEL A/B INSTANT ACCESS

For your convenience, two user assigned channels can be programmed for instant access. If the [A/B] key is pressed and no channel A or B has been assigned, a short beep will be heard.

PROGRAMMING A/B INSTANT ACCESS BUTTONS

1. Hold down the [A/B] key and turn on the transceiver.
2. The letter A will appear on the display and dashes "_ _" indicate that no channel has been designated channel A.
3. Press the [UP/DOWN] button until the desired channel number is displayed.
4. With the desired channel number displayed, press the [MEM] key once. The "A" will stop flashing, indicating that the displayed channel is now designated channel A.
5. Press the A / B button again. The letter "b" will appear on the display.
   Repeat steps 2 through to 4.
6. Switch transceiver off and on to exit this mode and save changes. If you wish to clear instant access channels follow step 1 then press the [MEM] key. The "A" will flash. Now switch the transceiver off and on again.

Note: Should you later wish to delete any stored channels simply press "MEM" key whilst in A/B programming mode.

OPERATION OF A/B INSTANT ACCESS BUTTONS

Pressing the [A/B] button will toggle between A, B and the previous selected working channel. Channel A is represented by the "A" to the left of the channel number on the LCD, & channel B is represented by "B".
Note: Do not confuse this "A" with the one that is sometimes displayed to the right hand side of the channel number (in USA and Canadian modes)

The Scan Function

1. Select the desired channel to be scanned using the & buttons.
2. Press the [MEM] button to store the channel in the transceiver's memory. [MEM] is displayed on the LCD. This channel is now memorised to be scanned.
3. To add further channels, repeat steps 1 & 2.
4. To delete a channel from the transceiver's scan list, press the [MEM] button on a channel that displays the [MEM] icon until the icon disappears.
5. All channels programmed remain in the transceiver's scan memory, even if the power is switched off.
6. Adjust the squelch control until the white noise is eliminated.
7. To start scanning, press the [SCAN] key. The scan proceeds from the lowest to the highest programmed channel number & stops on channels when a transmission is received.
8. To stop the scan at any time, press the [SCAN] key again.

VOX (Voice Operated Transmit)

Press the [MEM] button & switch the transceiver on. The VOX symbol & a "0" will flash. "0" indicates VOX is switched off, 1 is for low sensitivity, 5 is for normal sensitivity, and 9 is for high sensitivity. Use the [UP/DOWN] button to select the desired level, press [MEM] to confirm, the transceiver is now set to VOX. To switch VOX off, go back into VOX programming mode by holding the [MEM] key whilst switching on. Press the UP/DOWN button until the vox level is "off" and press [MEM] to confirm.

In VOX mode the transceiver will react to your voice, and transmit automatically without you having to press the PTT button. There is always a slight delay for the electronic switching & consideration will need to be given. To get optimum performance from the VOX feature you should use a noise cancelling headset or earpiece microphone (see accessory options).

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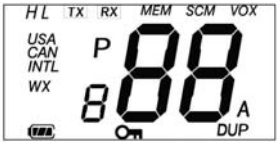
LCD Indicators



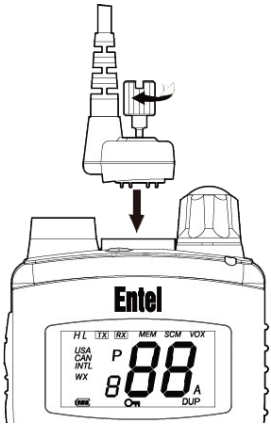
Indicator	Description
H	High power selected (5 Watts)
L	Low power (1 Watt).
TX	The Radio is Transmitting.
RX	The Radio is Recieving.
MEM	Indicated channel is memorised for scanning.
SCM	Scrambler mode enabled (version A & B only).
VOX	Voice operated transmit mode enabled.
USA	Indicates the channel set for USA.
CAN	Indicates the channel set for Canadian.
INTL	Indicates the channel set for International.
WX	NOAA weather channels selected (USA & Canadian waters only).
A	A ship-to-ship channel (in USA or Canadian mode).
	Battery life indicator.
	Indicates keypad is locked, excluding the PTT, H/L & LAMP buttons.
P	Private channel number selected.
DUP	Duplex channel selected (not simplex).

Optional Accessories

Attaching & Removing Accessories

To attach an accessory: Remove the accessory cover by unscrewing the locking screw anti-clockwise (leave cover attached or store in a safe place).
Attach accessory plug to the socket. Carefully tighten the locking screw clockwise until finger tight (do not tighten with a screwdriver etc).

To remove an accessory: Unscrew the locking screw of the accessory by hand in an anti-clockwise direction (carefully use a coin or screwdriver if too tight).
Ensure you re-fit the accessory cover so as to protect the socket.



Battery & Charger Options	
CNB750E	Spare 1800mAh Lithium-Ion battery pack with rear clip
CLB750G	Spare 2000mAh Lithium Manganese non-rechargeable battery with rear clip.
CSAHT	1-way intelligent rapid charger, 110-230v
CSBHT	6-way intelligent, rapid charger, 110-230v
CCAHT-230	1-way trickle charger with 230V mains adapter
CCAHT-110	1-way trickle charger with 110V mains adapter
CCAHT-12	1-way trickle charger with cigar lighter lead, 12V DC operation

Carry Options	
CFC750	HT64X soft leatherette case finished in black with carry strap
CLC752	HT642, HT648 heavy duty black leather case with strap & belt loop
CLC753	HT644 & HT649 heavy duty black leather case with strap & belt loop
CBH750	Spare spring loaded belt clip

Audio Accessory Options	
CMP1/750	Compact medium duty speaker microphone with earpiece jack
CMP750	Heavy duty submersible speaker microphone
EHP9	D-shaped earpiece (plugs into CMP1/750 or CMP750 above)
EA12/750	D-shaped earpiece with in-line PTT/microphone & VOX*
EA15/750	Earpiece microphone with transparent acoustic tube & VOX*
EA19/750	D-shaped earpiece with boom microphone and in-line PTT & VOX*
EHP750	D-Shaped earpiece (connects directly to radio)
EPT40/750	Bone conductive earpiece microphone with PTT
CXR5/750	Bone conductive skull microphone with in-line PTT
CXR16/750	D-shaped earpiece and throat microphone with in-line PTT

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Optional Accessories

CHP1/750	Light weight single earpiece headset with in-line PTT & VOX*
CHP750HS	Single earpiece ear defender headset with boom mic and in line PTT for hard hat & VOX*
CHP750HD	Double earpiece defender headset with boom mic and in line PTT for hard hat & VOX*
CHP750D	Double earpiece headband defender headset with boom mic and in line PTT & VOX*
CHP750BT	Bluetooth double earpiece headband defender headset with boom mic and ear cup PTT
CBH750	Spare spring loaded belt clip

*VOX = Voice Operated Transmit (hands free operation)

For complete up to date list of optional accessories visit www.entel.co.uk

Standard Features

Standard Features:

- Environmentally protected to IP68 i.e. submersible to 5 metres for up to 60 minutes.
- Robust design, exceeds MIL-STD-810C/D/E/F.
- LCD screen to display channel number & current settings \ status.
- 1800mAH Lithium-Ion battery for superior operational time.
- INT, USA, CAN channels.
- Full transmit power output 5 Watts.
- Exceptionally loud & clear audio .
- Ch 16 \ 9 shortcut button.
- WX shortcut button.
- Scan button.
- Monitor button.
- MEM button.
- Automatic power save to further increase operational time.
- Low battery alert indicates when the battery needs charging or replacing.
- Battery charge count to indicate when a battery needs replacing.

Dealer Programmable Features:

- Key lock button
- Prefixed minimum volume level and fixed bleep level
- VOX (Voice Operated Transmit) Function.

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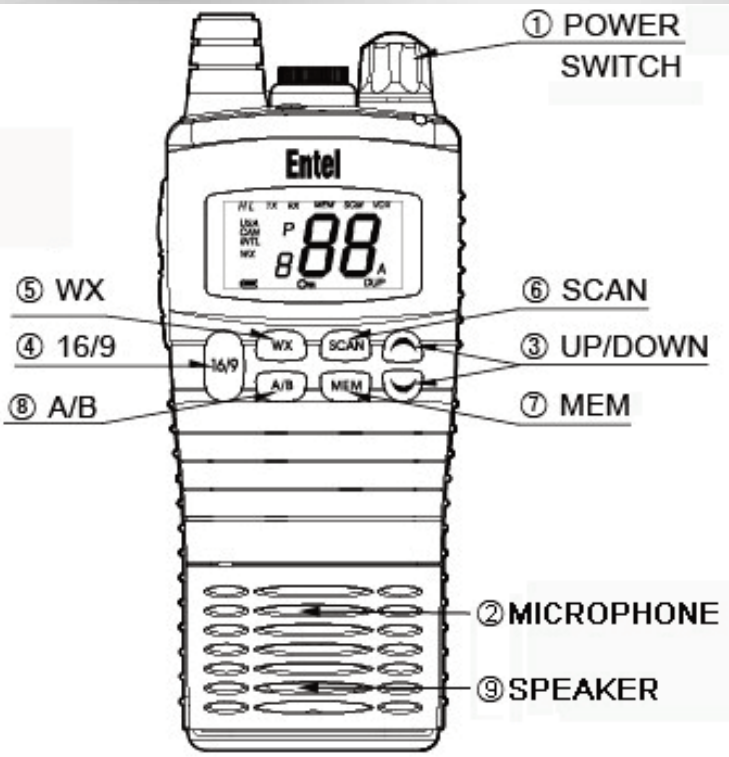
Controls



1 **Power & Volume Control:** Powers the radio on and off and controls the volume.
2 **The Microphone:** Internal condenser microphone
3 **Up / Down Buttons:** Press up / down buttons to change channel.
4 **16/9 Button:** A momentary press of the button selects channel 16 and a longer press select channel 9.
5 **WX Button:** Immediately recalls the weather channels.
6 **Scan Button:** Starts / Stops scanning the memorised channels.
7 **The MEM Button:** Memorises a desired channel for scanning.
8 **The A/B Button:** Provides Instant access to preassigned channels (if programmed)
9 **Speaker:** The Radio's Speaker.

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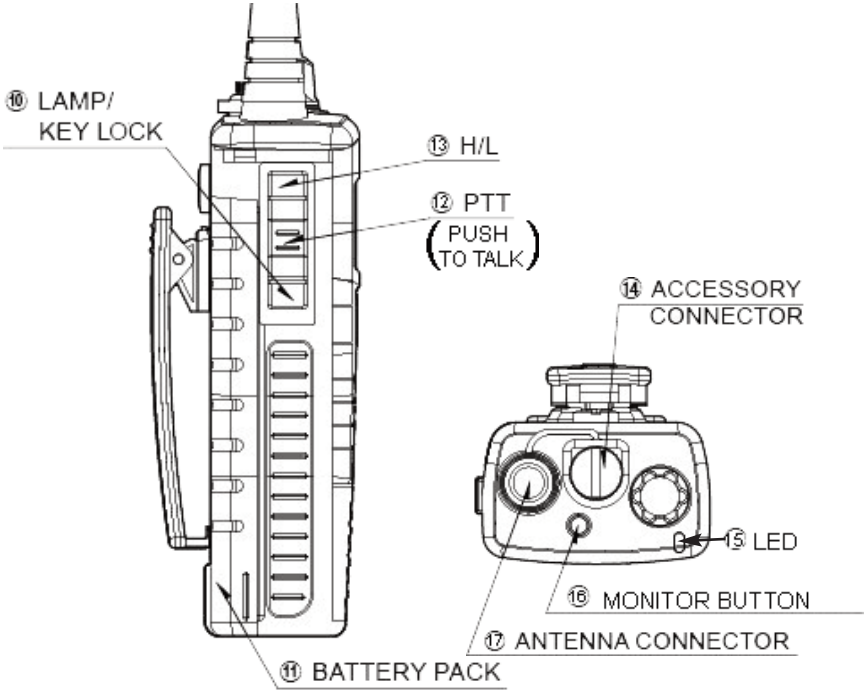
Controls



10 **Lamp / Key lock Button:** Momentarily pressing this button illuminates the LCD display. Holding this button for over 1 second activates the key lock. To deactivate the key lock press & hold the button again until the lock removes.

11 **The Radio's Battery Pack:** Rechargeable lithium-ion battery pack.

12 **PTT (Push To Talk Switch):** Hold down to transmit, release to receive.

13 **H/L Button:** Press and hold this button for 1 second to toggle between high and low power (1 & 5 Watts).

14 **The Accessory Connector:** Used to attach any HT644 approved accessory.

15 **LED Indicator:** Indicates the status of the radio:

- RED Steady = Transmitting
- RED Flashing slowly = Battery needs re-charging
- GREEN Steady = Receiving

16 **Monitor Button:** Press to monitor the channel without the squelch mute.

17 **Antenna Connector:** Use to attach the antenna of the radio.

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Glossary of Terms

Term	Description
Canadian Channels	Channels designated as defined and regulated by Industry Canada, (RIC), Marine Communications & Traffic Services.
Duplex	Transmit and receive on different frequencies.
Encryption	Scrambled audio for extra privacy.
FM	Frequency Modulation.
International Channels	Channel designations as defined for use in international waters by the International Telecommunications Union (ITU).
Marine Channels	Special channels reserved for marinas located in selected European countries. These channels are pre-programmed in the transceiver as P1 & P2.
Private Channels	Channels which are assigned by regulatory agencies governing VHF radio use for a specific region or country. These channels are prefixed with a "P" and can only be programmed into the transceiver by authorised dealers.
PTT	Press To Talk (Transmit)
RX	Receive
Simplex	Transmit and receive on the same frequency.
Squelch	To suppress background noise
TX	Transmit
Transceiver	A device that can transmit and receive
USA Channels	Channel designations as defined by the Federal Communications Commission (FCCVOX)
VOX	Voice Operated Transmit
VHF	Very High Frequency (30MHz to 300 MHz)

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Troubleshooting

SYMPTOM	PROBABLE CAUSE	REMEDY
Transceiver not switching on	Battery needs charging or battery is exhausted	Charge the battery pack replace the battery pack
The scan key does not start the scan	No channels memorised (MEM) Squelch is not adjusted	Use the MEM key to enter desired channels into scan memory. Adjust the squelch to threshold or to the point where the white noise just disappears.
Cannot change any function	Key lock is switched on	Turn key lock off
The LED on the charger does not illuminate when charging	Defective battery or charger. Dirty terminal contact on battery or charger	Contact your dealer Clean contacts with dry clean cloth
No transmit or cannot select high power	Some channels are low power only Battery pack exhausted	Change to high power channel Charge / replace the battery
Transceiver transmits without pressing PTT button Buttons seem to work intermittently	VOX has been enabled	Hold MEM button for 2 secs, use UP or DOWN button & select "off" to turn VOX off

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Channel Chart

CH	Channel Set			S/D	Frequency		Channel Use
	USA	CAN	INT		Receive	Transmit	
1A	X			S	156.05000		PORT OPERATION AND COMMERCIAL
1		X	X	D	160.65000	156.05000	PUBLIC, PORT OPERATIONS
2		X	X	D	160.70000	156.10000	PUBLIC, PORT OPERATIONS
3A	X			S	156.15000		US GOVERMENT, COAST GUARD
3		X	X	D	160.75000	156.15000	PUBLIC, PORT OPERATIONS
4A		X		S	156.20000		COMMERCIAL FISHING
4			X	D	160.80000	156.20000	PUBLIC, PORT OPERATIONS
5A	X	X		S	156.25000		PORT OPERATIONS, VTS IN SEATTLE
5			X	D	160.85000	156.25000	PUBLIC, PORT OPERATIONS
6	X	X	X	S	156.30000		INTER-SHIP SAFETY
7A	X	X		S	156.35000		COMMERCIAL
7			X	D	160.95000	156.35000	PUBLIC, PORT OPERATIONS
8	X	X	X	S	156.40000		COMMERCIAL (INTER-SHIP ONLY)
9	X	X	X	S	156.45000		BOATER CALLING CHANNEL
10	X	X	X	S	156.50000		COMMERCIAL / INTERSHIP
11	X	X	X	S	156.55000		COMMERCIAL / PORT OPERATIONS
12	X	X	X	S	156.60000		PORT OPERATION
13	X	X		S	156.65000		INTER-SHIP NAVIGATION SAFETY
13			X	S	156.65000		INTER-SHIP NAVIGATION SAFETY
14	X	X	X	S	156.70000		PORT OPERATION
15	X			R	156.75000	-	SHIP MOVEMENT
15		X	X	S	156.75000		SHIP MOVEMENT \ INTERSHIP
16	X	X	X	S	156.80000		INTERNATIONAL DISTRESS
17	X	X	X	S	156.85000		STATE CONTROLLED \ INTERSHIP
18A	X	X		S	156.90000		COMMERCIAL
18			X	D	161.50000	156.90000	PORT OPERATION, SHIP MOVEMENT
19A	X	X		S	156.95000		COAST GUARD
19			X	D	161.55000	156.95000	PORT OPERATION, SHIP MOVEMENT
20A	X			S	157.00000		PORT OPERATION
20	X		X	D	161.60000	157.00000	PORT OPERATION AND SHIPMENT
20		X		D	161.60000	157.00000	PORT OPERATION AND SHIPMENT
21A	X	X		S	157.05000		U.S. GOV, CANADIAN COST GUARD
21			X	D	161.65000	157.05000	PORT OPERATION, SHIP MOVEMENT

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Channel Chart

CH	Channel Set			S/D	Frequency		Channel Use
	USA	CAN	INT		Receive	Transmit	
22A	X	X		S	157.10000		
22			X	D	161.70000	157.10000	PORT OPERATION, SHIP MOVEMENT
23A	X			S	157.15000		U.S. GOVERNMENT ONLY
23		X	X	D	161.75000	157.15000	PUBLIC CORRESPONDENCE
24	X	X	X	D	161.80000	157.20000	PUBLIC CORRESPONDENCE
25	X	X	X	D	161.85000	157.25000	PUBLIC CORRESPONDENCE
26	X	X	X	D	161.90000	157.30000	PUBLIC CORRESPONDENCE
27	X	X	X	D	161.95000	157.35000	PUBLIC CORRESPONDENCE
28	X	X	X	D	162.00000	157.40000	PUBLIC CORRESPONDENCE
37			X	S	157.85000		MARINA CHANNEL
60		X	X	D	160.62500	156.02500	PUBLIC \ PORT OPERATIONS
61A	X	X		S	156.07500		-
61			X	D	160.67500	156.07500	PUBLIC \ PORT OPERATIONS
62A		X		S	156.12500		-
62			X	D	160.72500	156.12500	PUBLIC \ PORT OPERATIONS
63A	X			S	156.17500		PORT OPERATIONS
63			X	D	160.77500	156.17500	PUBLIC \ PORT OPERATIONS
64A	X	X		S	156.22500		
64		X	X	D	160.82500	156.22500	PUBLIC \ PORT OPERATIONS
65A	X	X		S	156.27500		PORT OPERATIONS
65			X	D	160.87500	156.27500	PUBLIC \ PORT OPERATIONS
66A	X			S	156.32500		PORT OPERATIONS
66A		X		S	156.32500		PORT OPERATIONS
66			X	D	160.92500	156.32500	PUBLIC \ PORT OPERATIONS
67		X	X	S	156.37500		INTERSHIP
67	X			S	156.37500		
68	X	X	X	S	156.42500		NON-COMMERCIAL
69	X	X	X	S	156.47500		INTERSHIP
70	X	X	X	R	156.25000	-	DIGITAL SELECTIVE CALLING
71	X	X	X	S	156.57500		PORT OPERATIONS
72	X	X	X	S	156.62500		NON-COMMERCIAL \ INTERSHIP
73	X	X	X	S	156.67500		INTERSHIP

Channel Chart

CH	Channel Set			S/D	Frequency		Channel Use
	USA	CAN	INT		Receive	Transmit	
74	X	X	X	S	156.72500		PORT OPERATIONS
75	X		X	S	156.77500		PORT \ GUARD CHANNELS
76	X		X	S	156.82500		PORT \ GUARD CHANNELS
77	X	X		S	156.87500		PORT OPERATIONS
77			X	S	156.87500		PORT OPERATIONS \ INTERSHIP
78A	X	X		S	156.92500		NON-COMMERCIAL
78			X	D	161.52500	156.92500	PUBLIC \ PORT OPERATIONS
79A	X	X		S	156.97500		COMMERCIAL
79			X	D	161.57500	156.97500	PORT OPERATION, SHIP MOVEMENT
80A	X	X		S	157.02500		COMMERCIAL
80			X	D	161.62500	157.02500	PORT \ SHIP MOVEMENT
81A	X	X		S	157.07500		
81			X	D	161.67500	157.07500	PORT OPERATION
82A	X	X		S	157.12500		
82			X	D	161.72500	157.12500	PUBLIC \ PORT OPERATIONS
83A	X	X		S	157.17500		
83		X	X	D	161.77500	157.17500	PUBLIC CORRESPONDENCE
84A	X			S	157.22500		PUBLIC CORRESPONDENCE
84	X	X	X	D	161.82500	157.22500	PUBLIC \ PORT OPERATIONS
85A	X			S	157.27500		PUBLIC CORRESPONDENCE
85	X	X	X	D	161.87500	157.27500	PUBLIC CORRESPONDENCE
86A	X			S	157.32500		PUBLIC CORRESPONDENCE
86	X	X	X	D	161.92500	157.32500	PUBLIC CORRESPONDENCE
87A	X			S	157.37500		PUBLIC CORRESPONDENCE
87	X	X		D	161.97500	157.37500	PUBLIC CORRESPONDENCE
87			X	S	157.37500		PUBLIC CORRESPONDENCE
88A	X			S	157.42500		COMMERCIAL
88	X	X		D	162.02500	157.42500	PUBLIC CORRESPONDENCE
88			X	S	157.42500		PUBLIC CORRESPONDENCE

Key:

- S = Simplex.
- D = Duplex.
- R = Receive Only.

Technical Specifications

GENERAL

Frequency Range	156 - 163.275MHz
Channel Spacing	25 kHz
Communication Method	Simplex
Antenna	High Efficiency Helical
Antenna Impedance	50 ohm
Power Supply Voltage	7.4 V DC
Battery Life	8 Hours
Current Drain (nominal)	Standby 40mA; RX: 390 mA; 1.0 W audio output (1kHz) TX: Less than 1 A at 2W, 0.7 A at 1W.
Duty Cycle	TX: 10%, RX 10%, Standby: 80%
Microphone	Internal condenser microphone
Operating Temperature	-20°C to 60°C
Size	Height = 130mm (145mm including knobs);
	Width = 59.5mm (62mm including protrusions);
	Diameter = 37mm (41mm including battery protrusions);
Weight	Less than 300g.

Technical Specifications

TRANSMITTER

Frequency Range	156.025 - 157.425
Power Output	Selectable: HIGH = 5W, LOW = 1W
Modulation	16K0G3E
Oscillator Method	PLL
Frequency Stability	±2PPM
Maximum Deviation	±5 kHz
Audio Distortion	< 5% (1 kHz 60%)
Spurious Emissiong	-55db
Hum & Noise	-40 [dB]

RECEIVER

Frequency Range	156 - 163.275MHz
Receiver Type	Double Super Heterodyne type
Sensitivity	<0.25uV (12dB SINAD)
Frequency Stability	±2PPM
Spurious Rejection	-60 dB
Adjacent Channel Selectivity	-70 dB
Distortion	< 3% Typical
Hum & Noise	-40 dB
Audio Output	1W
Speaker Size	38 mm

Notes

Use this page to record important information, such as the serial number of your radio and any private channels programmed by your dealer etc.

Notes

‘the professional’s choice’

<Intended Country Of Use>

☐ AT	☐ FR	☐ LT	☐ SK
☐ BE	☐ DE	☐ LU	☐ SI
☐ BG	☐ GR	☐ MT	☐ ES
☐ CY	☐ HU	☐ NL	☐ SE
☐ CZ	☐ IS	☐ NO	☐ CH
☐ DK	☐ IE	☐ PL	☐ UK
☐ EE	☐ IT	☐ PT	
☐ FI	☐ LV	☐ RO	

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